DOCUMENT RESUME

ED 205 114 HE 014 140

AUTHOR Paschke, Barbara P.
TITLE The Development and Results of a Survey Instrument to Predict Freshman Dropouts. AIR Forum 1981 Paper.
PUB DATE May 81
NOTE 23p.: Paper presented at the Annual Forum of the Association for Institutional Research (21st, Minneapolis, MN, May 17-20, 1981).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Persistence: *Attitude Measures: *College Freshmen: Dropout Attitudes: *Dropout Research: Extracurricular Activities: Higher Education: Institutional Research: Peer Relationship: Predictive Measurement: Student Adjustment: Student Attitudes: *Student Attrition: Student Characteristics: Student Experience
IDENTIFIERS *AIR Forum: *University of Kansas

ABSTRACT

A survey designed to predict freshman attrition was developed and tested at the University of Kansas. The 75-item survey, the Entering Freshman Survey, was administered to a uniform random sample of one-half of the freshmen entering the university in the fall 1979 semester or entering in the summer 1979 term and reenrolling in the fall. Based on the idea that students who feel academically and socially comfortable will be better able to handle stress and to persist at the university, questions sought to measure the student's feelings of comfort or discomfort based on their perception of their background or experiences. Additional questions borrowed from Astin's (1975) survey concerned the student's academic and family background, educational aspirations, study habits during the past year, expectations about college, financial sources, and work status. In the fall 1979 semester, 829 students were evaluated, and after spring 1980 enrollment, the respondents were separated into two groups, the 770 who reenrolled and the 59 who dropped out. It was found that a greater precentage of students who dropped out or transferred from the university in the spring semester than those who persisted had considered dropping out within the first half of the fall semester. There was a tendency for dropouts to be less satisfied with their present living situation than persisters and to be more pessimistic about their chances for academic success. Persisters seemed to enjoy extracurricular activities more than dropouts, and were more confident about their ability to make friends. The results of descriminant analyses and a bibliography are presented. (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

The Development and Results of a Survey Instrument to Predict Freshman Dropouts

ED205114

Barbara P. Paschke

Research Assistant

Office of Institutional Research and Planning

P.O. Box 2211

University of Kansas

Lawrence, Kansas 66045

Phone: (913) 864-4412

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Assoc. for Inst. Research

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

HE 014 140

THE ASSOCIATION FOR INSTITUTIONAL RESEARCH

This paper was presented at the Twenty-First Annual Forum of the Association for Institutional Research held at the Leamington Hotel in Minneapolis, Minnesota, May 17-20, 1981. This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of Forum Papers.

Mary Corcoran
University of Minnesota
(Editor, AIR Forum Publications)

Abstract

In an effort to predict which entering freshmen would reenroll and which ones would drop out, a 75-item survey was developed and administered to a uniform random sample of one-half the entering freshman class in Fall 1979. The survey included verbatim items from Astin's study as well as new items designed to measure characteristics where other researchers have found significant differences between dropouts and persisters. Discriminant analyses were run on various combinations of the data until students correctly classified as persisters or dropouts was 87.5%. This discriminant function is being tested on a new class of entering freshmen, and a new discriminant function will be developed using the entire population rather than a sample.

Background

Despite the seeming abundance of information about student attrition, basic satisfaction with already published materials eludes researchers and administrators alike. Perhaps the feeling that each institution is unique, that times have changed, or that existing studies do not really ask and answer the right questions motivates efforts to conduct the more ideal and tailored study. Whatever the reasons, the subject of student attrition continues to be explored and interest in the results remains keen.

Many of the research questions posed in the literature on attrition distill into the journalist's five, and this is not surprising. People want the story behind attrition. Who drops out? What happened? Where does this happen? When does it happen? Why do students leave? While all of these questions deserve attention, no one study ever answers all of them. The task would be far too ambitious and unrealistic; the story would be too large to tell.

Studies of who drops out focus on the descriptive differences between dropouts and persisters on a variety of demographic, academic, social, personal, financial, intellectual, or emotional variables, but a complete picture of students in either group is seldom achieved.

When attrition research concentrates on what happened, moral overtones are heard. The student failed to choose the right institution or major, to adjust, to study sufficiently, to budget time properly, or to behave responsibly, and the institution in turn failed to meet the student's needs, to teach and advise charismatically, or to provide a pleasing environment which meets the student's expectations of college life. Research in this area may take the form of after-the-fact questionnaires or interviews which seek the dropout's opinion of "what happened."

Another question frequently asked in attrition research is where -- where the students were enrolled before they dropped out or where the students went once they did drop out. Knowing the answer to this question provides data for institutional comparisons and gives some scanty information about student choices essential to learning where the competition is. It provides a basis for studying the student as a consumer in the educational marketplace.

Asking when students drop out introduces the time dimension into attrition research. Since traditional, linear concepts of learning assume that academic life mimics the ideal career and has a direction and goal, interruption of the flow may be perceived negatively by educators and even by the students themselves. Institutions invest heavily in identifying when attrition occurs, motivated perhaps by desires to bridge gaps, strengthen links, smooth the road, or reinforce stress points with institutional responses that will enable the student to move forward in the curriculum.

Why students drop out is a perennially favorite research question, and by far, the most difficult to answer. Emerging from efforts to answer this question is a seemingly endless list of psychological, social, sexual, demographic, academic, environmental, personal, financial, economic, institutional, and vocational reasons which may be further categorized into cognitive or noncognitive, academic or administrative, voluntary or involuntary, and personal or institutional reasons. The criteria for causality between two variables--time order, correlation, and not explainable by a third variable--are lost. Differences between groups become confused with reasons for behavior, or stated reasons are accepted as real, motivating causes when, often as not, they are socially acceptable

or face saving statements from students who themselves are not sure why they left school.

Survey Development

Given the epistemological dilemmas of previous research, how does one proceed to learn more about the nature of attrition? Astin (1975) faced the same dilemma and developed a predictive rather than a strictly descriptive study of dropouts. He asked who will drop out, not who did drop out and in doing so aimed his study toward the future rather than toward the past. He proceeded to survey 41,000 undergraduates at 358 two-year colleges, four-year colleges, and universities and established regression weights for each item in his survey which could then be multipled by an individual's score on the item and summed across items to produce the chances in one hundred that the student would drop out. Astin (1975) concluded:

> that student involvement is a key factor in persistence . . . that a student's tendency to drop out of college is inversely related to the degree of direct involvement in the academic and social life of the institution (p. 175-176).

The project described in this paper is based heavily upon Astin (1975). The idea of a predictive study had special appeal for several reasons. If a discriminant function were developed which could predict with reasonable accuracy students who were likely to drop out, the university would have a chance to effect or study those students before their probable departures from campus. Dealing with a targeted subset of students would likely be more efficient and effective than dealing with the entire population, whatever the university's chosen response might be. Besides, discriminant function analysis is a robust statistical procedure. It weighs and linearly combines variables so as to make the two groups (dropouts and

persisters) as statistically distinct as possible. Variables are entered or deleted from the analysis in a stepwise manner until a function which best discriminates the groups is established from the data.

Once it was decided to restrict the scope of this study to the entering freshman class, the search for predictive variables began. Since questions which Astin (1975) used in his survey provided reasonably predictive regression weights, many of his questions were used intact in what eventually was entitled the Entering Freshman Survey. Borrowed were questions about the student's academic and family background, educational aspirations, study habits during the past year, expectations about college, financial sources and work status.

The rest of the survey questions were based on a variety of theoretical models. Among these was Tinto's (1975) theoretical model for dropping out of school based on Durkheim's theory of suicide.

> According to Durkheim (1961), suicide is more likely to occur when individuals are insufficiently integrated into the fabric of society. Specifically, the likelihood of suicide in society increases when two types of integration are lacking--namely, insufficient moral (value) integration and insufficient collective affiliation. (p. 91)

Tinto (1975) describes college "as a social system with its own value and social structures" (p. 91-92). Within such a context, Tinto (1975) states:

> one can reasonably expect, then, that social conditions affecting dropout from the social system of the college would resemble those resulting in suicide in the wider society; namely, insufficient interactions with others in the college and insufficient congruency with the prevailing value patterns of the college collectively. (p. 91-92)

Writing a few years later, Cope (1978) reaffirms Tinto's idea when he states that "college dropouts and stopouts perceive themselves as having less social interaction than do persistors" (p. 9).

A similar theme appears when Noel (1978) describes the "staying environment" at colleges and universities:

> A synthesis of research and actual institutional experience identifies two major components as essential to a "staying environment": (1) the academic component (curriculum, instruction), which is further divided into intellectual growth, progress toward educational and career goals, academic success, clear program and course options, and available advising; and (2) the social/psychological component (faculty, peers) comprised of a feeling of belonging, personal worth, positive identity, and high self-esteem. (p. 96)

This idea of participating and belonging in some way is expressed by Hoyt (1978) in terms of student satisfactions which he believes "arise from two sources: a sense of progress (including expected progress) in reaching personal goals and a sense of comfort with the environment (acceptance, security, freedom from pressure)" (p. 79).

Given that attrition literature repeatedly emphasizes the importance of intellectual growth and social or value congruence in the student's life at the university, many of the questions used in the Entering Freshman Survey were developed around these themes. The governing idea behind these questions was that students who feel academically and socially comfortable will be better able to handle whatever stress occurs and persevere, whereas students who feel less comfortable will be more likely to quit when the going gets rough in any area of their life.

To measure the student's feelings of comfort or discomfort, new questions were developed to measure the student's perception of his or her background or experiences rather than the facts about the student's life. Subjective rather than objective data were sought. For the most part, item answers were constructed as Likert scales so that some kind of ordinal intensity could be measured. The verbal labels on the scales were varied to accommodate the question and to keep the attention of the students while they were answering the items. Another tactic for increasing vigilance throughout the questionnaire was scale reversals--some moved in a positive direction (disagree to agree) and some moved in a negative direction (very satisfied to extremely dissatisfied), a technique which prevents monotonous response patterns and increases response variance. Finally, three open-ended questions were included as a way of gleaning new insights about the students and of allowing the students to express themselves outside of closed, categorical responses.

Procedure

The population chosen to receive the Entering Freshman Survey was confined to a uniform random sample of one-half of the freshmen entering the University of Kansas in the Fall 1979 semester or entering in the Summer 1979 term and reenrolling in the fall.

During the fifth week of fall semester, questionnaires were prepared for 1,841 students, but 32 invalid addresses reduced the actual number of questionnaires mailed to 1,809. Another copy of the questionnaire was sent four weeks later to the 1,206 students who had not yet responded to the first mailing. A total of 927 students returned surveys in the postage-paid envelopes provided with the questionnaires. When screening procedures were completed, 829 usable responses remained.

In order to determine the frequencies and percentages for the response categories on each item on the survey for all of the survey respondents, the coded responses were run through SPSS subprogram FREQUENCIES. One of the most interesting results occurred in responses to one of Astin's (1975) questions which asked students to assess their chances of dropping out of the university. About 35% were sure that they would not drop out of the university even temporarily and another 45% thought that there was a very good chance that they would not drop out. However, nearly 20% of the Entering Freshman Survey respondents thought there was at least some chance that they would drop out temporarily and they thought this within six weeks of their enrollment at the university. This would seem to indicate that about one in five respondents either enters the university with weak possibilities for staying or develops attitudes and experiences early in the college career which weaken the commitment and motivation to stay. Only about 17% of the students thought there was little or no chance of their transferring before graduating.

After spring enrollment, survey respondents were separated into two groups, the 770 (92.9%) students who reenrolled and the 59 (7.1%) students who dropped out. Once these groups were established, it became possible to look for descriptive and predictive information in the data. A number of statistically significant differences appeared between the responses of students who reenrolled for the spring semester and those who did not. A greater percentage of students who drop out or transfer out of the university in spring semester than those who stay have already entertained the idea of doing so within the first half of the fall semester. There is a tendency for dropouts to be less satisfied with their present living situation than persisters and more pessimistic about their chances for academic success. Persisters seem to enjoy extracurricular activities more

than dropouts, they are more confident about their ability to make friends, and they more often think it is easy to make friends. More persisters than dropouts say they would choose to attend the university again if they were starting their freshman year over again whereas more dropouts than persisters are inclined to say that the university is too big and impersonal.

Dropouts and persisters seem to come from different home environments insofar as the parents of persisters have usually completed more years of school than the parents of dropouts. Their academic background differs in that more persisters than dropouts give their high school high ratings for academic quality and more dropouts than persisters rate their high school as about average.

In order to determine if one or more linear combinations of the variables could discriminate between the groups, discriminant analyses of the data were run. Since the persisters dramatically out numbered dropouts, a random sample of persisters was used instead of the entire group. Questionnaire items were divided into two subsets for analysis because of size limitations in the SPSS subprogram DISCRIMINANT.

The first set of items on the freshman survey produced a discriminant function which correctly classified 75.18% of the cases while the second set of items produced a discriminant function that correctly classified 83.92% of the cases. The best predictor items from the two runs involving survey items were combined into one discriminant analysis which resulted in a discriminant function which correctly classified 87.5% of the cases. About 84% of the persisters were correctly classified and about 16% were erroneously predicted as dropouts. About 6% of the dropouts were erroneously predicted as persisters, but about 94% of the dropouts were correctly predicted as dropouts. In other words, the discriminant function

predicted dropouts better than it predicted persisters. Table 1 summarizes the results of the analysis, and is quite simply the most important product of this project. It means that using a discriminant function developed

---

Table 1 here

---

from the students' own responses to questionnaire items administered during their first fall semester at the university, 87.5% of these same students were correctly predicted as dropouts or persisters. Table 2 lists the questionnaire items which contributed to the discriminant function.

Table 2 here

Among the three items contributing most to the discriminant function, two are questions about dropping out. One asks students to assess their chances of dropping out, the other asks their chances of transferring before graduation. In other words, simply asking students early in their first semester to assess their chances of dropping out or transferring is one of the best predictors of who will drop out and who will reenroll. To test the power of the discriminant function without these two items, the function was computed again with those items removed. The percentage of cases correctly classified dropped from 87.5% to 80.8%.

A final analysis compared the characteristics of dropouts and persisters on eleven data elements from the Student Records Information System. The variables analyzed were sex, ethnic category, marital status, residency, home states, nationality, home county, school, transferred hours, housing type, and commuter status. Several descriptive differences were found.

- The lowest percentage of dropouts in the freshman class lived in university scholarship halls followed by private rooming houses and university halls.
- Commuters had a substantially higher dropout rate than noncommuters.
- A slightly greater percentage of females than males dropped out.
- American Indians had the highest percentage of dropouts and Asians or Pacific Islanders had the lowest percentage of dropouts.
- Foreign students had a higher dropout rate than students from the United States.
- Slightly more residents dropped out than nonresidents.
- Of the home states with large numbers of students on campus, the highest percentage of dropouts were from Colorado and Kansas.
- Among the Kansas counties with large numbers of students at the university, Johnson County had the most students and the next to lowest percentage of students dropping out. Douglas county had a relatively high dropout rate compared to other counties.
- The highest percentage of dropouts occurred in the School of Education, but large differences exist in the numbers of students enrolled in the various schools so this fact may be misleading.

Conclusion

The development of a highly predictive discriminant function based on a sample of entering freshmen is a first step toward focusing the university's efforts to retain students as an identifiable subgroup of students. The Office of Institutional Research and Planning is presently conducting a second survey of entering freshmen using items from the first survey which had a high predictive or descriptive value. The first year's function will be applied to the second year's responses as a test of its

predictive power on a separate group, and results of the discriminant function prediction will be compared to actual dropout data for the second group. A second discriminant function will be developed from the modified survey with the hope of improving its power by basing it on a large sample of students.

Bibliography

Adams, Hazard. The academic tribes. New York: Liveright, 1976.

Anderson, Edward. A retention design applied to an equal opportunity program. In Lee Noel (Ed.). Reducing the dropout rate. San Francisco: Jossey-Bass, Inc., 1978.

Astin, Alexander W. Personal and environmental factors associated with college dropouts among high aptitude students. Journal of Educational Psychology, 1964, 55(4), 219-227.

Astin, Alexander W. Preventing students from dropping out. San Francisco: Jossey-Bass, Inc., 1975.

Bard, Bernard. College students: why they drop out. Educational Digest. 1969, 34(7), 18-21.

Brooks, William, and Emery, Lawrence. College dropouts: a review from two schools. Canadian Counsellor. 1974, 8(3), 146-151.

Chambers, J.L., Barger, Ben, and Luberman, Lewis R. Need patterns and abilities of college dropouts. Educational and Psychological Measurement. 1965, 25(2), 509-516.

Chase, Clinton I. The college dropout: his high school prologue. NASSP Bulletin. 1970, 54(342), 66-71.

Chickering, Arthur W., and Hannah, William. The process of withdrawal. Liberal Education. 1969, 15(4), 551-558.

Coker, David L. Diversity of intellective and non-intellective characteristics between persisting and non-persisting students among

campuses. (Office of Education DHEW, ED033645) Wisconsin State University, Stevens Point, 1968.

Cope, R.G. Why students stay, why they leave. In Lee Noel (Ed.). Reducing the dropout rate. San Francisco: Jossey-Bass, Inc., 1978.

Cope, R.G., and Hannah, W. Revolving college doors: the causes and consequences of dropping out, stopping out, and transferring. New York: John Wiley and Sons, Inc., 1975.

Cope, Robert G., and Hewitt, Raymond G. Types of college dropouts: an environment press approach. College Student Journal. 1971, 5(2), 46-51.

Crockett, David S. Academic advising: a cornerstone of student retention. In Lee Noel (Ed.). Reducing the dropout rate. San Francisco: Jossey-Bass, Inc., 1978.

Domer, Dennis E. Selective admissions and academic success: a study of the first decade of undergraduates in the School of Architecture and Urban Design, the University of Kansas. Unpublished doctoral dissertation, University of Kansas, 1980.

Endo, Jean J. and Harpel, Richard L. A longitudinal study of student outcomes at a state university. Presented at the Annual Forum of the Association for Institutional Research, 1980.

Fisk, Terrie, and McKnight, Philip. Attrition: review of recent literature and recommendations. University of Kansas: Office of Instructional Resources, Technical Report No. 9, 1979.

Graves, Robert. Comments on lineal and nonlineal codifications of reality. In Marshal McLuhan (Ed.). Explorations in communication . Boston: Beacon Press, 1966.

Hahn, Ralph W. In defense of dropping out. Community College Review. Winter, 35-40, 1974.

Hoyt, Donald P. A retrospective and prospective examination of retention-attrition research. In Lee Noel (Ed.). Reducing the dropout rate. San Francisco: Jossey-Bass, Inc, 1978.

Kohen, Andrew I., Nestel, Gilbert, and Karmas, Constantine. Factors affecting individual persistence rates in undergraduate college programs. American Educational Research Journal. 1978, 15(2), 233-252.

Krishnan, K.S., and Clelland, R.C. Selection of undergraduate freshman using discriminant analysis. Journal of Experimental Education. 1973, 41(3), 28-36.

Lee, Dorothy. Lineal and nonlineal codifications of reality. In Marshal McLuhan (Ed.). Explorations in communication. Boston: Beacon Press, 1966.

McIntosh, Barbara M., Wilson, Lolita N., and Lipinski, Beatrice. The extent and nature of student attrition in the first five years at Simon Fraser University. Conseiller Canadien. 1974, 8(3), 163-173.

Nie, Norman H., Hull, C. Hadlai, Jenkins, Jean G., Steinbrenner, Karin, Bent, Dale H. SPSS. New York: McGraw-Hill Book Co., 1975.

Noel, Lee. First steps in starting a campus retention program. In Lee Noel (Ed.). Reducing the dropout rate. San Francisco: Jossey-Bass, Inc, 1978.

Pantages, Timothy J., and Creedon, Carol F. Studies of college attrition: 1950-1975. Review of Educational Research. 1978, 48(1), 49-101.

Peng, Samuel S., and Fetters, William B. Variables involved in withdrawal during the first two years of college: preliminary findings from the national longitudinal study of the high school class of 1972. American Educational Research Journal. 1978, 15(3), 361-372.

Pervin, Lawrence A., Reik, Louis E., and Dalrymple, Willard. The college dropout and the utilization of talent. Princeton, N.J.: Princeton University Press, 1966.

Rose, James R. Some plain talk on retention by a college dean. In Lee Noel (Ed.). Reducing the dropout rate. San Francisco: Jossey-Bass, Inc., 1978.

Rump, E.E., and Greet, N.S. The characteristics and motivations of students who withdraw without failing. Australian Universities' Review. 1975, 18(2), 150-160.

Saenger-Ceha, M.M.Th. Psychological and Social Factors in Student Drop-Out. Amsterdam: Swets and Zeitlinger n.v., 1970.

Sheldrake, Peter. Failure and withdrawal: student dropout at Flinders University. Vestes. 1976, 19(2), 25-29.

Slater, Marlow. Perception: a context for the consideration of persistence and attrition among college men. Personnel and Guidance Journal. 1957, 35, 435-440.

Stamen, E. Michael. A general model for predicting student attrition. Presented at the Annual Forum of the Association of Institutional Research, 1980.

Starr, Ann, et al. Differences in college student satisfaction: academic dropouts, nonacademic dropouts, and nondropouts. Journal of Counseling Psychology. 1972, 19(4), 318-322.

Terenzini, Patrick T., and Pascarella, Ernest T. The relation of freshman students' social and academic integration to attrition. Presented at the Annual Forum of the Association for Institutional Research, 1976.

Terenzini, Patrick T. and Pascarella, Ernest T. Voluntary freshman attrition and patterns of social and academic integration in a university: a test of a conceptual model. Research in Higher Education. 1977, 6, 25-43.

Thorndike, Robert M. Correlational Procedures for Research. New York: Gardner Press, Inc., 1978.

Tinto, Vincent. Dropout from higher education: a theoretical synthesis of recent research. Review of Educational Research. 1975, 45(1), 89-125.

Table 1

Discriminant Analysis Classification Results

Using "Best"[a] Predictors from Freshman Survey

ACTUAL GROUP		PREDICTED GROUP MEMBERSHIP	
Name of Group	Number of Cases	Here	Gone
HERE Spring 1980	93	78	15
		83.9%	16.1%
GONE Spring 1980	51	3	48
		5.9%	94.1%

Percent of "Grouped" cases correctly classified = 87.50%

[a]"Best" items = 5, 7, 9, 10, 11, 12, 16, 18, 20, 30,
31, 32, 35, 36, 39, 40, 41, 45, 47, 48,
51, 53, 56, 62, 63, 68, 69, 71, 72, 73, 75.

[b]Based on a random sample of students who returned in Spring 1980.

158 cases were processed

14 cases had at least one missing discriminating variable

144 cases were used in the final analysis.

Table 2

Summary Table for Discriminant Analysis

Using "Best" Predictors from Freshman Survey

Step	Item Entered	Wilks' Lambda	Name of Item
1	69[a]	0.843767	Drop out of KU temporarily.
2	9[a]	0,737894	How much education did your father complete?
3	71[a]	0.661386	Transfer before graduating.
4	56	0.622438	I enjoy participating in extracurricular activities at KU.
5	7[b]	0.594566	While you were growing up, where did you live most of the time?
6	5	0.569211	I attended a KU summer orientation program.
7	41	0.550303	Quality of classroom instruction.
8	47	0.525704	My ability to do the academic work.
9	72[a]	0.507646	Obtain an overall grade point average of A- or better.
10	73[a]	0.478877	Graduate with honors.
11	12	0.463855	What was your average grade in high school?
12	68	0.455751	Maintain good friendships.
13	51	0.435999	My experience with other students.
14	36	0.429028	Writing.

Table 2 (concluded)

Summary Table for Discriminant Analysis

Using "Best" Predictors from Freshman Survey

Step	Item Entered	Wilks' Lambda	Name of Item
15	32[a]	0.422222	Studies with radio or record player on.
16	18[a]	0.417672	On the average, how many hours per week are you presently employed?

Note: Level of significance on all 16 items equals 0.0.

[a]Item taken directly from Astin (1975).

[b]Item based on Astin (1975).